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Natural History

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A Half Hour in Natural
History.

By S. H. PEABODY, PH. D.

Regent Illinois Industrial University.

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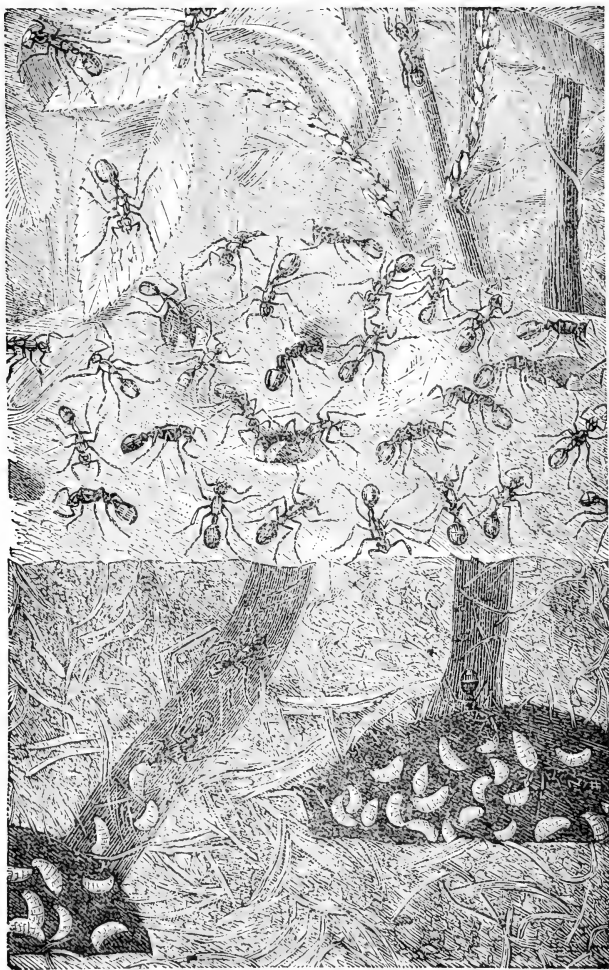
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ABOUT ANTS.

BRANCH — *Articulata* — Consisting of rings, or joints.

CLASS — *Insects* — Having bodies divided into two or three distinct parts.

ORDER — *Hymenoptera* — Having membranous wings.

FAMILY — *Formicaria* — Ant family.



DO you ever find yourself, some dreamy summer day, with nothing to do? The hot, dense rays of the July sun scorch the dry grass, glow in the burning sand, and almost hiss in the water of the idle stream. The birds hide in the dense thickets, the cattle pant in the shade, and the very dog wishes he could take his jacket off. The strawberry leaves crisp in the heat, and rest upon

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the ground; the corn curls its green blades, and turns blue; the portulaccas shut their cups; the pansies hang their heads; even the giant sunflower droops his broad leaves, and the cabbages perspire. It is too warm to work, or to read, or to play. The boy has exhausted all his own plans for fun, and in despair asks his mother, "What shall I do?"

I'll tell you what to do. Find an ant-hill in some shady place, where the sun will not burn your back, lie down upon your face, and watch it. You have passed such a thousand times, without knowing what curious things could be seen there. The little fellows worked all the morning, and brought up out of that hole in the middle, all the grains of sand that you see piled around in a tiny, circular fortress. One by one they brought them out and laid them in their places. Now they are thoroughly warmed by the sun, and they are carrying them back again, into the rooms which they have excavated below. If there is a flat stone near, turn it over, and you will quite likely

find a much busier crowd. A large chamber, with many winding passages running hither and thither, and connecting with each other, and with other passages underneath, has been made, like the public square and the thronged streets of an old fashioned city. It is not like the exact, right-angled, stiff, modern town, but the lanes turn in and out, and yet go on with persevering directness towards some particular spot which was not down in the original plan, although a point of much consequence. Scattered all along the thoroughfares of this stone-canopied town, and quite plenty in the grand square, are many long, round, white some-things, a little like grains of wheat. People have mistaken these things for the food of the ants, and so have written,

“The little ant, for one poor *grain*,
Doth tug, and toil, and strive.”

But the ants lay up no food. They need none; for as soon as the hard frosts of autumn chill them, they lie down to sleep till the spring

wakes them again. If they did lay up food, it would not be grain, for the ant can no more eat grain than a man can eat gold, and the ant is not so big a fool as to hoard what he can not use.

Others have thought that these little white sacks are the eggs of the ants; but eggs do not grow, and surely ants can not lay eggs that are larger than themselves. Whatever they are, the ants evidently think them very valuable. Away they go, over the clumps of earth, and through the tiny streets, as if to see what has happened, and estimate the damage. They don't quite understand it, but they are agreed that one thing is to be done forthwith — these precious little sacks must be carried in, out of danger. So each grasps the nearest, and drags it away to the hole in the centre, the gateway of the inner town, where you see the throng coming out. The sack is larger than the ant, but he seizes it resolutely, and raises it over his head. Away he creeps, but it strikes that block of sand at the street corner, and

he can not lift it over. He lays it down and pulls the end of it round; that obstacle is past, but another is beyond. A second worker comes, and the two, by pulling at one end and lifting at the other, have brought it to the gate. Surely they can not get it through that narrow and crooked passage. One has gone below, and the sack shuts him from sight. The other tugs and pulls. It will not move. Yes, it does; see that end rise in the air; now it sinks in the hole; now it is out of sight. But here comes another, and another. All are hurrying to the numerous stairways to the city below, and in a short time all will have vanished.

These sacks contain the young ants. The eggs were laid by the queen, and hatched by the warmth of the hot grains of sand. The grubs were fed, and grew, and finally shut themselves up in the sacks, as the caterpillar spins a cocoon, or the beetle-grub sheds his coat and becomes a chrysalis. Then the ants take great care of these sacks. They

ABOUT ANTS.

are very precious to them because they contain their children. If the air is damp and cold, or the rain falls, they carry them down into the lower rooms, and keep them warm. If the sun is warm and bright, they are brought where the warmth may be felt, without making them too dry. If they happen to be exposed, we have seen how they are hurried to a place of safety. If you should carefully dig down into the earth, you would find the underground city very extensive, the long, winding galleries lying tier after tier beneath each other, and leading to large apartments, where the ants and their children find room.

Three kinds of ants come out of these cocoon-sacks. There are males, which have four wings; females, which are much larger, and have two wings; and a third kind, called workers, or nurse-ants, which have no wings. After midsummer the several kinds may often be seen very busy about an ant hill, the winged ants trying to get away, and the workers bringing them back as often as they can find them

The males seem to be worthless fellows, and soon disappear. They have no sting to protect themselves with, and no jaws to help them get a living.

Some of the females are caught by the workers, and taken back to the nest. Others wander away with a few followers and found new colonies, while others stray away by themselves, going out into the wide world alone. When one alights, she examines the new land which she has discovered, to see if it is fit for a home. If she is satisfied, she turns back her head, bites off her wings at the shoulders, and settles down for life. Her wings carried her from her mother's house to her new home, and henceforth her journeying is ended. Then she begins to hollow out a chamber for herself. Even if she has workers with her, she continues to toil until she has laid eggs; then she is recognized and honored as a queen. If alone, she has to continue her toil until the young from her own eggs make a colony about her. The grubs, when hatched, are fed by the nurse-ants, or by the

mother, with food prepared in the stomach, and the solitary insect has much to do, to find food for herself and her hungry family.

Ants eat various substances, particularly such as are juicy, or contain sugar. They kill and eat weaker insects, and they are very fond of ripe, sweet fruit. One may be sure they will always choose the best. If the pioneers can not eat the whole of some plunder which they have found, they carry away what they can, and then bring back an army to carry off the rest. They are very fond of a substance called honey-dew. Ants are often seen running up and down the trunks of trees, even when there is no fruit on the tree to tempt them. As the trees which they visit are often sickly, they are supposed to do some injury. They are not at all to blame, but are only going to their farms to look after their cattle. The leaves and tender twigs of these trees will be found to be covered with small, pale-green insects, called *Aphides*, or Plant-lice. They are often very closely packed upon the leaf or stem, and they

do harm by sucking up the juices of the growing plant. The ant comes up the tree to his dairy farm, and strokes one of the green lice with his feeler; the louse gives out a single drop of clear liquid, which the ant drinks. Then he goes to the next, and so on, milking his cows, or gathering honey-dew. When he has enough, he goes back to his work, digging, building, or feeding the young ants.

The working ant does a great deal of work in a day. M. Huber, a French naturalist, gives an account of a single day's work of one ant. The insect first dug in the earth a groove or road, about a quarter of an inch deep and four inches long. The dirt which he took out, he kneaded into pellets, and placed on each side of his road, to make a wall. When this road was finished, very smooth and straight, he found that another was wanted, and he made that in the same manner, and about the same size. A man, to have done as much in proportion to his size, must have dug two ditches, each four and a half feet deep, and seventy-two

feet long; he must have made the clay into bricks, and laid them up in walls on each side of the ditches, two to three feet high and fifteen inches thick. He must have gone over it all and made it straight and smooth; and must have made it alone, in ground full of logs and stones.

The Brown Ants, *F. brunnea*, are both miners and builders. They work either at night or in damp weather, because the sunshine dries their mortar too fast. They build a house of many stories, sometimes twenty or thirty. Each story is about a fifth of an inch high, supported by many partitions and pillars. In wet weather they take the family into the upper rooms; in dry weather they occupy the middle or the lower floors. While building, they work the damp clay in their jaws until the pellets are compact, and will adhere firmly; then they press them tightly against the tops of the partitions which they have made. As fast as one row of bricks has dried, another row is added; thus they will lay a perfectly smooth and strong ceiling two

inches in diameter. When these walls are finished, the rain and sun seem only to make them harder. If a stick or straw is in their way, they at once make a beam or a post of it. If a post, they cover it with mortar until it is thick and strong enough for their work. If a beam, they build their ceiling against and around it. If a room is too large, they build partitions, and divide it into smaller rooms of suitable size.

Other Ants are carpenters. They often remove so much of a log of wood as to leave it a mere honey-comb, pierced through and through in every direction with their passages. The walls between are often as thin as paper, and yet are never broken through except where one passage crosses another. They can not know how to cut so near another passage by sight, for all is done in the dark; they can not plan or measure, as a reasoning being would do; and yet they do their work with greater delicacy and accuracy than the man who reasons and measures. For some unexplained cause,

the wood through which they cut is all colored black, as if the fire had passed through it.

When these black carpenters get into a dwelling, they cause a deal of trouble. They make themselves at home in the very wood-work of the house. They gnaw a way into any wooden box which they wish to explore, and will find the least crevice into the sugar-box or cake-jar. The prudent housewife puts her pot of sweetmeats in a pan of water, but if the ants know what the jar contains, they will find a way to it, even if they crawl upon the shelf above, and drop down upon it. The family may be almost exterminated, and yet, if two or three be left, with all the resources of the nest at their command, in a little time the plagues are as thick as ever. Moreover, they bite.

Some tribes of Ants are very warlike, and they make war to capture the workers of other tribes, and obtain slaves for their own communities. It is said that the kidnappers are always pale or red Ants, and that the captured slaves are black. When the red Ants are about to

make a foray, they send scouts to explore the ground, who afterwards return and report their success. They then march forth in regular armies. The assailed town pours out its inhabitants, and the fight begins. Head to head, foot to foot, jaw to jaw, the sable warriors defend their homes and their children, but in vain. The victory is always with the invaders. They do not drive out their conquered foes, but they break into their homes and carry away the cocoons of the workers. The red ants return in perfect order to their own city, bearing with them their living burdens. They treat the plundered young with the same care they give their own, and the ants produced from the stolen cocoons seem to work with abundant energy and good will. The inhabitants of the besieged city, knowing what result will follow the fight, often carry away many of their young. They take them to the tops of the grass stems, and hide them amid the foliage of other plants. When the raid is over, they bring them back to the nest again. Several

kinds of ants practice this kind of warfare, and the results are too well attested by careful observers to admit of doubt.

Although there are many kinds, and countless numbers of Ants in the cooler countries of the temperate zone, they are far surpassed in number, in size, and in venomous power, by those found in the hot lands of the torrid zone. Here all kinds of reptile and of insect life seem to be extravagantly developed, and the ants are often so numerous and so powerful as to drive away every other living thing.

The Saüba or Coushie Ant, *Ecodoma cephalotes*, lives in South America. It is often called the Parasol Ant. Large columns may be seen marching along, each carrying in its jaws, and over its head, a round piece of leaf, about the size of a dime. Many suppose that this is actually carried to keep off the heat of the sun; but the fact is that they use the leaves to thatch the roofs of their houses, and to keep the loose earth from falling in. They choose the leaves of cultivated trees, as the orange and

THE SAÜBA ANTS.

the coffee. When they attack a tree, they strip it of foliage so entirely, that it often dies. Then they march away with their plunder, and fling it on the ground, at the nest. Another party of workers take up the pieces, and put them upon the roof, covering them with dirt. These domed houses are wonderfully large, measuring sometimes two feet in height, and forty feet in diameter. Their underground cities are on even a larger scale. The smoke of burning sulphur blown into one opening has been found to come out at another, more than two hundred feet away.

There are three kinds of these ants: the winged, the large headed—sometimes called soldiers, and the workers. The large headed are also of two sorts: one kind has a smooth helmet, covered with horny substance, which one can almost see through, and the other wears a dark helmet, covered with hairs. The business of these large-heads is not very well understood. The smooth helmets seem to do nothing but walk about. They do not fight:

they do not work; they do not appear to overlook those which do work. The hairy-helmets are not known to do any more. If the top of one of the mounds be taken off, a circular well will be found in the centre, into which a stick three or four feet long may be thrust, without touching bottom. Presently some of these hairy-headed fellows, each wearing one eye in the middle of its forehead, like a fabled Cyclops, will come slowly up the smooth sides of the well, to see what is wanted. But they are not very pugnacious, and may easily be caught by the fingers.

The winged ants are the perfect males and females. They come out a little after midsummer, that is in February. The females have bodies about as large as hornets, and spread their wings nearly two inches. The males are much smaller. Although hosts pour out of the nests, few remain after a day, for the birds and insect eating animals have devoured most of them. Those which escape found new colonies in spite of all the dangers which threaten

to destroy them; even the art of man can not conquer them.

Among the South American Ants are several species which are classed together, and called Foraging Ants. They belong to the genus *Eciton*. They have been confounded with the Saüba Ants, just described, but their habits are quite different. The real Foraging Ant, *E. drepanephora*, is very annoying, and very useful. These insects go out from their cities in immense armies, not very broad, but often a hundred yards long. Officers march beside the column, very busy keeping their own portion of the line in order. There is an officer to about twenty privates; their white heads nodding up and down make them quite conspicuous. The pittas, or ant thrushes, always accompany these armies, picking up the Ants for their own food; but still the band goes marching on. The people know that the Ants are on the war path, and make every preparation for their reception.

In those countries, insects of every kind get

into the houses, and multiply to an extent which almost drives the inhabitants from their homes. By day they are a trouble, and by night a pest. They bite, and suck, and scratch, and sting. They crawl over the food; they hide in the bed; they fly into the lamp, and then whirl on the table; they creep into the ink; they emit horrible smells. There are centipedes which sting, and scorpions which sting. There are cockroaches of powerful size and smell, and of insatiable appetite. As for snakes and lizards, and other creeping things, they are too common to be noticed. It is of no use to fight. Your enemies are legions of numbers innumerable. But when the Foraging Ants come, the case is altered, for nothing can stand their attack. When the pittas come about, the people open every box and drawer in the house, so as to allow the ants to explore every crevice, and then they vacate the premises.

“Presently a few scouts, which form the vanguard of the grand army, approach, and seem

to inspect the house, to see if it is worthy of a visit. The long column then pours in and disperses over the dwelling. They enter every crevice, and speedily haul out any unfortunate creature which is hidden therein. Great cockroaches are dragged unwillingly away, being pulled in front by four or five ants, and pushed from behind by as many more. The rats and mice speedily succumb to the onslaught of their myriad foes, the snakes and the lizards fare no better, and even the formidable weapons of the centipedes and scorpions are overcome.

“In a wonderfully short time the Foraging Ants have done their work, the turmoil gradually ceases, the scattered parties again form into line, and the army moves out of the house, carrying its spoils in triumph. When the inhabitants return, they find every intruder gone, and to their great comfort may move about without treading on some unfortunate creature, or put on their shoes without knocking them on the floor to shake out a scorpion or a centipede.”

But those who are accustomed to the country are careful to keep out of the way. If a man should happen to cross the column, the ants at once dash at him, climb up his legs, and bite with their powerful and poisonous jaws. His only safety is in running away until the main army is too far off to renew the attack, and then destroying those which he has brought with him. This is not easy, for the Ants have long, hooked jaws, and bite so fiercely that they may be pulled away piecemeal, leaving the jaws in the wound to be picked out separately.

Another species, *E. prædator*, marches in broad, solid mass. It is a little creature, like our common red ant, but much brighter colored, making the trunk of a tree upon which many climb look as if smeared with a blood-red liquid.

This little red ant is exceedingly venomous: its bite brings a quenchless, burning sensation, whence the Brazilians call it "fire ant." The South American Indians require their young men to undergo the ordeal of the Tocan

deiros, or fire-ants, before they can be known as warriors, or recognized as braves. A pair of mittens are made of the bark of the palm tree, long enough to cover the arms above the elbows, and are filled with the Tocandeiros. The candidate for warlike honor must put his hands into these bags of living fire, and wear them while he makes the round of the village, and dances a jig at every pause. During this march he must wear a smiling face, and chant a kind of song so loud as to be heard above all the noise his companions may make upon rude horns and drums. He must not, by word, action, or look, show any sign of the torture which he endures; if he should, he will be the ridicule of his tribe, and even the maidens will refuse to know him. When the round of the village is complete, he must pause before the chief with swifter dance, and louder chant, until he falls from exhaustion, and the burning gauntlets are removed. Then he has won his right to carry a spear with his tribe.

A species, *E. legionis*, attacks the nests of

some of the large burrowing ants. They arrange themselves for this purpose into two bands; one set dig into the ground and take out pellets of earth, while the others receive the pellets and carry them away. They will thus sink a hole ten or twelve inches, and always succeed in opening the nest. The materials they pull to pieces and carry home, as well as the inmates. The community is in wonderful discipline. Each ant knows his place, and attends to his business.

The species *E. erratica*, is blind. The eyes of the other varieties are very small, but in the Blind Ant they are absolutely wanting, not showing even a trace. They have, however, some means of knowing light from darkness, for they are very uneasy when brought into the light.

They are wonderful builders, constructing long galleries through which they travel. If a gallery be broken into, the soldiers are seen slowly coming out, and opening their large jaws as if they would bite something. If not

disturbed, they retire into the gallery, and soon the workers come and repair the breach. These galleries are built upon the surface of the earth, and do not penetrate the soil.

Some Ants make their nests in trees, hanging them from the boughs, like the wasps. One of these carries its abdomen in the air, hanging over its back, and has acquired the uncouth name *Crematogaster*, or "hanging-belly." Another is called by travelers the Green Ant, *Ecophylla virescens*. The name signifies a house and a leaf, and is given because it makes its hanging nest of dried leaves. When disturbed, the Ants come pattering down upon the man below like rain-drops, seeking for spots which they can wound, and having a special faculty for finding their way down the neck.

A tribe of Ants somewhat similar to the *Ecitons* of South America, is found in Africa, and is called Bashi Kouay, or Driver Ant, *Anomma arcens*. It is the dread of all animals, from the leopard to the smallest insect. It

marches through the forest in lines about two inches broad, and of incredible length. One writer asserts that he has seen a column of these insects continue passing a single point, at good speed, for twelve hours. Officers march along the line and maintain order. If the advance guard come to an open place, not shaded by trees, they build a covered way, or tunnel, of dirt moistened with their saliva. If there are sticks and leaves on the ground, they fill up only the spaces which are exposed, for the direct rays of the sun kill them very quickly. If a stream crosses their path, they make a bridge of themselves, over which the whole pass. First a single Ant swings himself from the branch of a tree which overhangs the water. Then another crawls over him, and hangs from his feet. Others follow until a living chain is formed which reaches to the water, and rests upon it. Then the wind or the current wafts the free end of the chain about until it touches the opposite shore, and the crossing is complete. If one chain bridge

is insufficient, others are made alongside. It is asserted that the bridge is even made tubular, and that the army marches through it.

When the Ants get hungry, the long line stops marching by the flank, as soldiers would say, that is, following each other in line, and moves like an army in line of battle, devouring every thing in its way. The black men run for their lives. In a very short time a mouse, a dog, a leopard, or even a deer, is overrun, killed, eaten, and only the bones are left. When they enter a house, they clear it of every living thing. If a fowl is the victim, they dig out the feathers by the roots, and then pull the flesh to pieces, fastening their strong pincers into it, and never failing to bring away the piece.

A white hunter killed an antelope, and brought it to a native village. In the night he felt himself terribly bitten, and roused his attendants. The whole village was attacked by a column of the Bashi Kouay, which was attracted by the smell of the meat. The

natives protected themselves by making circles of fire and standing inside. Before morning the insects had eaten every thing they could get, and had traveled on.

During the abundant tropical rains the Drivers run together and form themselves into balls, varying in size, but usually about as large as those used in the game of ball. These balls of ants float upon the water until the land appears again, and the insects can go about their business. The natives try to destroy them by making fires over and about their nests. This does not accomplish much, for the cunning ants escape before the heat becomes too great, and will be found hanging in festoons upon the neighboring trees, and crossing from one to another by their chain bridges.

These ants are black, with a tinge of red. They have enormous heads, equaling about one third of their entire length. The jaws are sharply curved, and cross each other when closed, so that if the ant has fixed itself, its hold can not be loosened unless the jaws are

opened. It has no appearance of external eyes.

Dr. Lincecum has observed an Ant in Texas, which has been called the Agricultural Ant, *Atta malefaciens*. When this species has fixed its home in good dry ground, it bores a central hole, about which it raises the surface perhaps six inches, making a low mound, which gently slopes to the outer edge. If the spot be wet, the mound is raised higher, and is even fifteen or twenty inches high. The space about the mound is carefully cleaned and smoothed like a pavement. Nothing is allowed to grow in this circle, two or three feet from the centre, except a single species of grass. This grass the ants tend with the greatest care, cutting away the weeds within and about it. It thrives under their culture, and bears a crop of seed which resembles, under the microscope, miniature rice. When ripe, it is carefully harvested, and carried into the cells, where it is cleaned of the chaff, and packed away. If the grain gets moist in damp weather, it is taken out and

dried on the first fair day, and the sound kernels are carried back again; those which have sprouted are thrown away. Since men have made farms in that country, and the cattle have eaten down the ant-rice, thus spoiling their crop, the ants have either abandoned the pastures, or those communities have perished. They may be found in places where the cattle can not get at their crop of grain.

Dr. Lincecum is confident, after twelve years observation, that these ants plant the grain, take care of it, harvest it, and keep seed for another sowing. Each year the crop of ant-rice is found growing about their cities, and not a blade of any other green thing can be found within twelve inches of this grain.

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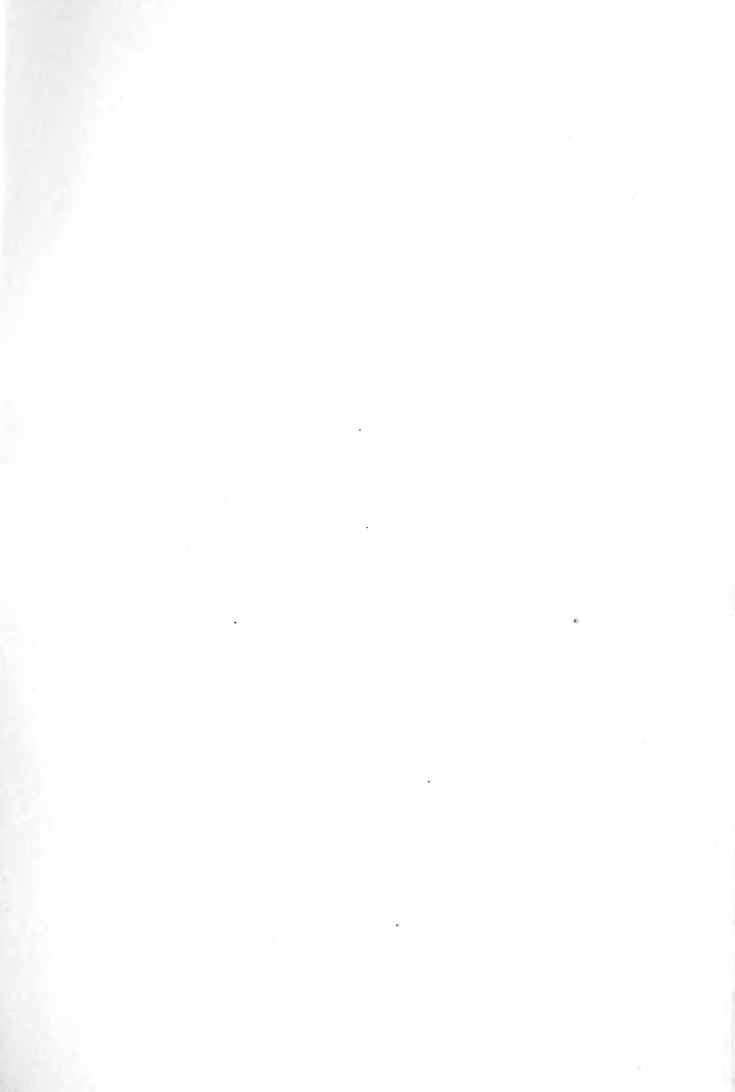
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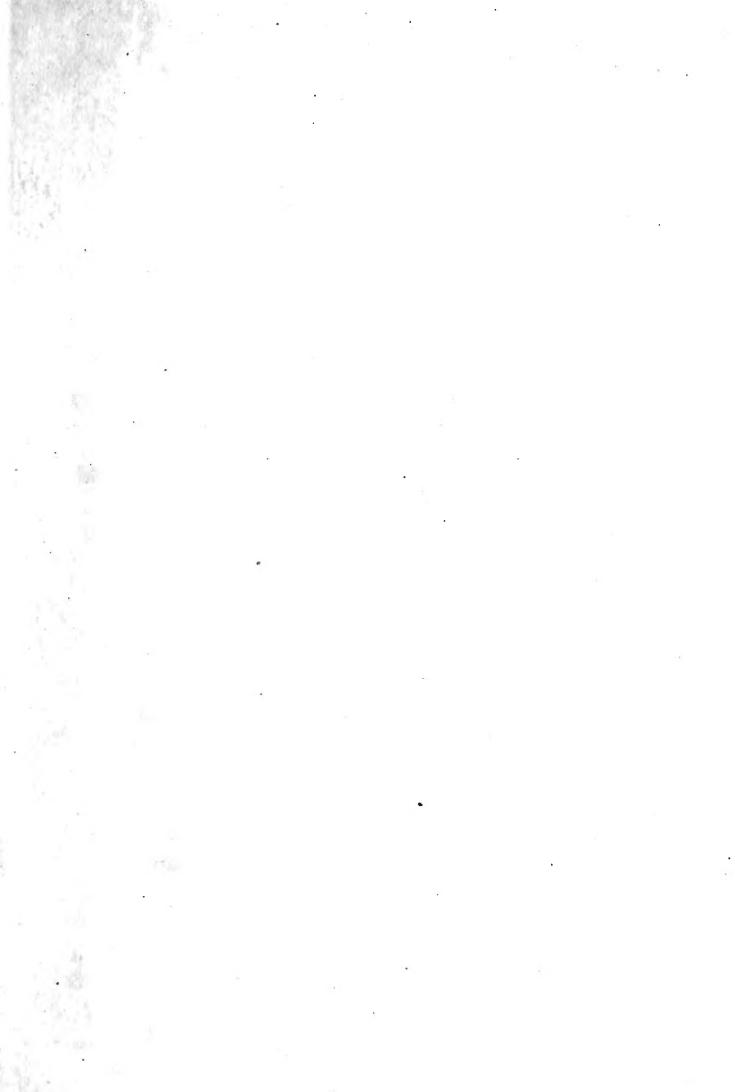
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